

Notice of Allowability

Application No.

10/660,863

Examiner

Stanley J. Pruchnic, Jr.

Applicant(s)

SHIH ET AL.

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 24 February 2005.
2. ☒ The allowed claim(s) is/are 1,3 and 5-23.
3. ☒ The drawings filed on 11 September 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with **Timothy B. Kang at (703) 652-3817** on 14 March 2005.

2. The application has been amended as follows in order to more clearly describe the invention:

In the Specification:

3. On Page 18, in Line 16, after the word "particular", the word "stating" has been deleted and replaced therefor by the correctly spelled word --starting-- in order to correct an obvious typographical error.

In the Claims:

4. In Claim 6, Line 1, after "Claim", the numeral "4" has been deleted and --1-- has been inserted therefor in order to correct the claim dependency, since Claim 4 was cancelled previously by Applicant.

Reasons for Allowance

5. The following is an examiner's statement of reasons for allowance:

OSONE does not disclose or fairly suggest waiting to do the calculation until the temperature information should have **reached a steady state** as claimed by Applicant, but instead appears to continually measure the temperatures and calculate values for thermal resistance. Moreover, the constant pressure (load) would only need to be adjusted (controlled) when the system is **not** in thermal equilibrium, since a **change** in temperature that results in a change in sample thickness would not occur when the system is in thermal equilibrium. Whenever control inputs are required to maintain the desired constant pressure (load), the system is not in thermal equilibrium at that time.

EL-HUSAYNI (e.g., Col. 8, Lines 8-32) characterizes thermal properties of materials, but only purports to determine whether the system was in thermal equilibrium

after calculating the thermal property values. The check is dependent on an operator determining a value for an acceptable deviation in the measurements, so does not actually necessarily determine that the system was in equilibrium, but only can report that a desired statistical deviation in results was obtained. In Contrast, Applicant (e.g., in Claim 1) bases the calculations on data obtained in a step of measuring temperatures following a time when the temperature measurements should have reached a steady-state according to a previous trial run of said sample. Moreover, EL-HUSAYNI does not disclose or suggest any adjustment of an applied pressure to a sample.

Regarding claims 1 and 15: Claims 1 and 15 are allowable because the prior art of record fails to teach or fairly suggest a test method including

adjusting the pressure applied at each of a plurality of different pressures to maintain a constant temperature, each of the plurality of different pressures being applied at different times to a thermally conductive thermal interface material (TIM) sample, even though said sample expands and contracts with changes in its temperature; and

characterizing the thermal material properties of said sample based on temperature measurements obtained in a step of measuring temperatures, as claimed by Applicant, when the temperatures should have reached a steady-state according to a previous trial run of said sample, taken together with the other limitations of the claims renders the claims allowable over the prior art.

Regarding claim 10: None of the prior art of record discloses or fairly suggests a materials testing system including a compensating controller adjusting the pressure applied to the sample to be constant, as claimed by Applicant, and including a computer configured to build a thermal-resistance-curve model following a time when ***the temperature information should have reached a steady state according to a previous trial run of said sample***, as defined in the claim, in combination with the other limitations, each arranged and functioning as recited in claim 10.

6. **Claims 3, 5-9, 11-14 and 16-23** are allowable by virtue of their dependency upon the respective of Claims 1, 10 and 15.

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in PTO-892 and not mentioned above disclose related materials thermal properties testing systems and methods:

- US 5297868 A (Graebner; John E.) discloses **a steady-state method** for characterizing thermal properties of materials by measuring temperature differences, calculating heat flux from one hot plate to another and inferring thermal conductivity from the experiment using Fourier's law of heat conduction. This method is based on a model of one-dimensional steady-state heat flow through a sample body.
- US 6183128 B1 (Beran; Robert Lynn et al.) discloses **a transient method** for characterizing thermal properties of materials, *i.e.*, not waiting for steady-state conditions as claimed by Applicant.
- US 6331075 B1 (Amer; Tahani R. *et al.*) discloses **a steady state method** for measuring thermal conductivity of thin samples and discloses measuring setups may include adjusting the pressure (varying applied weight) on the sample, since thermal conductivity can vary depending on the applied weight. There is no suggestion of controlling an applied pressure (weight) in response to changes in sample dimensions due to sample temperatures.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stanley J. Pruchnic, Jr., whose telephone number is **(571) 272-2248**. The examiner can normally be reached on weekdays (Monday through Friday) from 8:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are

unsuccessful, the examiner's supervisor, Diego Gutierrez (Art Unit 2859) can be reached at **(571) 272-2245**.

10. The *Official FAX* number for Technology Center 2800 is (703) 872-9306 for all official communications.

Any inquiry of a general nature or relating to the status of this application or proceeding may be directed to the official USPTO website at www.uspto.gov or you may call the **USPTO Call Center** at **800-786-9199** or 703-308-4357. The Technology Center 2800 Customer Service FAX phone number is (703) 872-9317.

The cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site, from the Office of Public Records and from commercial sources.

Private PAIR provides external customers Internet-based access to patent application status and history information as well as the ability to view the scanned images of each customer's own application file folder(s).

For inquiries relating to Patent e-business products and service applications, you may call the **Patent Electronic Business Center (EBC)** at **703-305-3028** or toll free at **866-217-9197** between the hours of **6 a.m. and midnight Monday through Friday EST**, or by e-mail at: ebc@uspto.gov. Additional information is available on the Patent EBC Web site at: <http://www.uspto.gov/ebc/index.html>.

GAIL VERBITSKY
PRIMARY EXAMINER

so
Stanley J. Pruchnic, Jr.
14 March 2005

